DOI 10.32900/2312-8402-2025-134-114-127
UDC 636.32/38.084

PRODUCTIVE PERFORMANCE AND HEMATOLOGICAL PROFILE OF DNIPRO MEAT BREED EWES DURING THE EARLY SUCKLING STAGE

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The research results on the metabolic processes in Dnipro Meat breed ewes at the initial stage of the suckling period depending on the number and sex of newborn lambs are presented. The ewes during lambing were divided into two groups of 10 animals each. The first group included ewes that gave birth to a single lamb, while the second group consisted of ewes with twin lambs.

At the beginning of the neonatal period, the rearing of newborn lambs is fully provided by the milk production of the ewes. The milk yield of ewes during the first 20 days of the suckling period, which nursed a single lamb, was at the level of 26.5 kg for ewe-lambs and 27.5 kg for ram-lambs, whereas for ewes with twins, the total milk yield amounted to 43.5 kg. As a result, the average daily milk yield during this period for ewes with single lambs was 1.33–1.38 kg, and for ewes with twins, it was 2.18 kg, which was higher by 58.0–63.9%.

Probable discrepancies in live weight indicators depending on the type of lamb birth have been identified. In single-born lambs, the predicted growth intensity was higher compared to twin-born lambs, with a difference of 34.5% among ram-lambs and 27.1% among ewe-lambs ($p<0.01$).

Among the key indicators of the chemical composition of milk in the experimental groups of ewes, the baseline values corresponded to the protein content – 5.84-5.82% – and lactose content, which was at the level of 4.77-4.78%. In the milk of ewes with single-born lambs, the fat content was 5.56% and was slightly higher compared to ewes with twins by 0.14 absolute percentage points.

It has been established that there are certain differences in the morphological composition of blood among the experimental ewes. More significant changes in red blood parameters are observed in ewes with twins, who not only have a higher number of erythrocytes – 9.1±0.27 T/L, compared to ewes with a single lamb – 8.7±0.17 T/L, but also a higher concentration of hemoglobin in them.

It has been determined that the blood of ewes with twin lambs contained a significantly lower number of leukocytes compared to ewes with single lambs — by 23.5%, which indicates a lower immunological reactivity of the organism, caused by a greater stress load on ewes with twin lambs.

The obtained data regarding the study of the morphological composition of ewe blood parameters during the most intense phase of the suckling period have practical significance for their application in the development of breeding measures aimed at forecasting their productivity.

Keywords: uterus, lambs, growth rate, milk yield, milk composition, blood.

ПРОДУКТИВНІСТЬ ТА ГЕМАТОЛОГІЧНИЙ ПРОФІЛЬ ВІВЦЕМАТОК ПРИДНІПРОВСЬКОЇ М'ЯСНОЇ ПОРОДИ НА РАННЬОМУ ЕТАПІ ПІДСИСНОГО ПЕРІОДУ

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Представлено результати досліджень за процесами метаболізму у вівцематок придніпровської м'ясної породи на початковій стадії підсисного періоду в залежності від кількості і статті новонароджених ягнят. Вівцематки в процесі ягніння були розподіленні на дві групи по 10 голів. До першої групи ввійшли тварини, які родили одне ягня, друга група складалася з маток з ягнятами-двійнями.

Початок неонатального періоду вирощування новонароджених ягнят повністю забезпечується молочністю маток. Молочність вівцематок за перші 20 діб підсисного періоду, які відгодовували одне ягня була на рівні 26,5 кг за ярочками і 27,5 кг – баранцями, тоді як з двійнятами сукупна молочність склала 43,5 кг. В результаті середньодобова молочність у цей період маток з ягнятами-одинаками склала 1,33-1,38 кг, а у маток з двійнями 2,18 кг, що було більше на 58,0-63,9 %.

Виявлено вірогідні розбіжності за показниками живої маси в залежності від типу народження ягнят. У ягнят-одинаків прогнозовано інтенсивність росту була вищою порівняно з ягнятами-двійнями, між баранцями вона становила 34,5 %, а ярочками – 27,1 % ($p<0,01$).

Серед визначальних показників хімічного складу молока дослідних груп маток базисній величині відповідав вміст білка – 5,84-5,82 % і лактози, вміст якої був на рівні 4,77-4,78 %. У молоці вівцематок з ягнятами-одинаками вміст жиру становив 5,56 % і виявився дещо вищим стосовно вівцематок з двійнями на 0,14 абс. відсотка.

З'ясовано, що у показниках морфологічного складу крові між піддослідними вівцематками відзначаються певні відмінності. Спостерігаються більш значні зміни в показниках червоної крові у вівцематок з двійнями, які мають не тільки вищу кількість еритроцитів – 9,1±0,27 Т/л, тоді як у маток з одним ягням – 8,7±0,17 Т/л, а й більш високу концентрацію в них гемоглобіну.

Встановлено, що в крові вівцематок з ягнятами двійнями була значно менша кількість лейкоцитів, відносно маток з одинаками – на 23,5%, це вказує на нижчу імунологічну реактивність організму, що обумовлено більшим стресовим навантаженням на тварин з ягнятами-двійнями.

Отриманні дані щодо вивчення морфологічного складу показників крові вівцематок у найбільш напружену фазу підсисного періоду мають прикладне значення для практичного їх застосування при розробці селекційних заходів спрямованих на прогнозування їх продуктивності.

Ключові слова: матки, ягнята, інтенсивність росту, молочність, склад молока, кров.

Introduction. Modern livestock farming imposes increasingly stringent requirements for assessing animal productivity. Therefore, an urgent task is to improve the meat productivity and reproductive qualities of sheep through reliable selection

methods. This requires the rational use of available resources and continuous monitoring of the productive and biological characteristics of newly created meat sheep genotypes, which make it possible to identify the most promising animals for breeding (Zharuk L. V., 2022; Mykytyuk V. V., 2023).

Due to the decline in sheep numbers in the country, there has arisen a need to increase the frequency of desirable genotypes in populations by identifying and widely using valuable breeding individuals. At the same time, most sheep breeds do not fully possess the necessary level of productivity, primarily due to mediocre fertility rates. To increase production volumes in the sheep industry, it is essential to maximize the genetic potential of the reproductive capacity of sheep of import-substituting intensive types (Polska P. I., 2020).

The key selection traits for successful sheep breeding are increasing the fecundity and milk production of ewes. It is the milk production of ewes that ensures the growth and development of newborn lambs during the first month of the neonatal period and subsequently contributes to the realization of the genetic potential of inherited precocity (Lesyk O. B., Pokhyvka M. V., 2020).

It is important to consider that deficiencies in nutrition and improper care of ewes during pregnancy significantly affect the overall development of the fetus — the duration of prenatal development, its weight, and viability (Rooke J. A. et al., 2008; Cukharlov V. O., 2010).

Ideally, ewes should give birth to a live lamb without complications, providing a reliable source of colostrum and milk within a stable maternal environment (Everett-Hincks, J. M. et al., 2004; Dwyer, C.M., 2007). The number of newborn lambs has a significant impact on the genetic evaluation of maternal ability to rear lambs successfully (Kim L. Bunter et al., 2017).

Moreover, lambs need to adapt to the external environment, being able to suckle within a relatively short period after birth to maintain the necessary energy levels and regulate their own body temperature (Everett-Hincks, J. M. et al., 2014; Bunter, K. L. et al., 2023).

Milk productivity, given an adequate level of ewe nutrition, is determined by the number of lambs born, the duration of productive use, live weight, and the level of provision with the necessary nutrients in the feeding ration (Asín, J. et al., 2021; Yakovchuk V. S., Zhulinska O. S., Ivanyna O. P., 2021).

In all sheep breeds, the milk productivity of ewes determines the growth and development of lambs, their health, viability, and survival rate. This factor becomes particularly significant for ewes that give birth to two or more lambs.

Research by Stapay P. V., Gavrylyak V. V., Stakhiv N. P., Paranyak N. M. (2016) established that the milk yield of ewes is closely correlated with fecundity. Thus, over 100 days of lactation, the milk productivity of ewes with one lamb amounted to 97.2 kg, with two lambs – 120.0 kg, with three lambs – 153.0 kg, and with four lambs – 169.1 kg.

On average, the chemical composition of sheep's milk in terms of the main indicators is as follows: total solids – 17.8%, fat – 7.4%, protein – 5.7%, lactose – 4.8%, and ash – 0.9% (Rooke J. A. et al., 2008; Stapay P. V., 2010; Thomas, D. L. & Haenlein, G. F. W., 2017).

Many aspects of this issue require a thorough understanding of the specifics of metabolic processes during the most critical periods of animal rearing. The basal metabolism in the body of ewes during all physiological periods depends on the intake of

nutrients and biologically active substances (Mykytyuk V. V. & Porotikova I. I., 2020; Yefremov et al., 2020; Asín et al., 2021).

The most accessible system for research, which reflects the entire complex of physiological and biochemical processes in the body of animals, is blood. Therefore, data on blood parameters make it possible to assess the direction of metabolic processes, the health status of animals, and, to a certain extent, the nature of productivity (Vovkotrub et al., 2021).

Assessing the milk productivity of ewes and the growth intensity of offspring through determining the relationship between hematological blood parameters and metabolic status during the suckling period is a relevant problem, as it allows for the formation of a scientifically substantiated opinion on the course of redox reactions in the body of sheep of newly created breeds.

Purpose of the study. The study was aimed at determining differences in productivity indicators in ewes of the Dnieper meat breed depending on the number and type of lambs born in the early period of neonatal rearing.

Materials and research methods. The experimental part of the research and the collection of necessary results were carried out during the lambing of ewes of the Prydniprovska meat breed at the sheep complex of the State Enterprise "Runo Research Farm" in Dnipropetrovsk region, as well as at the Department of Animal Feeding and Breeding Technology and the Research and Development Center for Biosafety and Environmental Control of Agro-Industrial Complex Resources of Dnipropetrovsk State Agrarian and Economic University (DSAEU).

During lambing, two experimental groups of sheep, each consisting of 10 ewes, were formed. The first group consisted of ewes with a single lamb, while the second group included ewes with twin lambs. In the course of the scientific research, zootechnical methods were applied to evaluate the studied productivity traits, which involved determining the live weight of lambs at birth and at 20 days of age, as well as calculating the average daily and total body weight gains.

The milk yield of the ewes was determined by multiplying the total weight gain of the lambs from birth to 20 days of age by a coefficient of 5, which assumes that an average of 5 kg of milk is consumed to produce 1 kg of lamb weight gain at this age (Ibatullin, I. I. & Zhukorsky, O.M., 2017).

On the third day after lambing, blood samples were taken from the ewes for laboratory analysis, as well as milk samples to determine its chemical composition.

The total number of erythrocytes and leukocytes, hemoglobin concentration, and hematocrit value were determined in blood using microcentrifugation according to the relevant methodologies (Levchenko et al., 2020). The indices of "red" blood – color index (CI), mean corpuscular hemoglobin (MCH), and mean corpuscular volume (MCV) – were calculated mathematically.

Milk samples were analyzed using an ultrasonic milk analyzer Ekomilk Total (Ultrasonic Milk Analyzer) (BULTEH2000 Ltd., Bulgaria).

For all types of analysis, a value of $p \leq 0.05$ was considered statistically significant. Statistical processing of the results was performed using the Statistica 10 software (StatSoft Inc., USA, 2011).

Experimental studies were conducted in accordance with the requirements of the Law of Ukraine No. 3447 – IV of 21.02.06 "On the Protection of Animals from Cruelty" and in accordance with the main principles of the "European Convention for the Protection of Vertebrate Animals Used for Experimental and Other Scientific Purposes"

(Strasbourg, 1986), the declaration "On Humane Treatment of Animals" (Helsinki, 2000), and the National Congress on Bioethics "General Ethical Principles of Animal Experimentation" (Kyiv, 2001).

Research results. The live weight of newborn lambs is an indicator of obtaining viable and well-developed offspring. Overall, the condition and live weight of newborn lambs, both singles and twins, corresponded to standard indicators but were at the minimum level.

Single-born male and female lambs did not significantly differ in live weight, which averaged 3.8±0.14 kg for ram lambs and 3.6±0.09 kg for ewe lambs. Among twins, no sexual differences in live weight at birth were observed between ram lambs and ewe lambs, and it was at the level of 2.6 kg (Table 1).

Table 1.

Intensity growth newborn young and milk yield of ewes (M±m, n=5)

Gender	Live weight, kg		Live weight gain		Average milk yield of ewes, kg (per lamb)
	newborns	20 days	20 days, kg	daily, g	
Singles					
Ram-lambs	3.8*±0.14	9.3±0.13	5.5±0.11	275.7*±1.29	1.38 ±0.12
Ewe-lambs	3.6*±0.09	8.9±0.10	5.3±0.12	265.9*±1.34	1.33 ±0.16
Twins					
Ram-lambs	2.6 ±0.09	6.9±0.10	4.3±0.10	215.2 ±1.28	1.09±0.14
Ewe-lambs	2.6±0.11	7.0±0.10	4.4±0.13	220.1 ±1.19	1.10±0.12

*Note. * – P<0.05 in compare to the group of ewes with singles*

To determine the milk productivity of ewes, the growth intensity of newborn lambs up to 20 days of age was studied. Significant differences in live weight indicators were found depending on the type of lamb birth.

The live weight of newborn single-born lambs was significantly higher ($p < 0.05$) compared to twin-born lambs, with an advantage of 46.2% for ram lambs and 38.5% for ewe lambs.

A higher growth intensity was observed in single-born lambs compared to twins during the first 20 days of rearing. Single-born ram lambs exceeded twins by 34.5%, and single-born ewe lambs by 27.1%, with these differences being statistically significant ($p < 0.05$).

Depending on gender, the difference between singles and twins was neither substantial nor predictable. Among single-born lambs, ram lambs had a 4.5% advantage, whereas among twins, a slight advantage (1.5%) was observed in ewe lambs.

The determination of average daily weight gains in the experimental young stock also confirmed the advantage in growth intensity of single-born ram lambs, which amounted to 275.7±1.29 g during this period. The average daily gain of ewe lambs was slightly lower – 265.9±1.34 g, while in twins, it was respectively 215.2±1.28 g and 220.1±1.19 g.

By calculation, the milk yield of ewes during the first 20 days of the suckling period was determined. Thus, in ewes that gave birth to a single lamb, depending on its sex, the milk yield was at the level of 26.5 kg for ewe lambs and 27.5 kg for ram lambs, whereas in those with twins, the average milk yield amounted to 43.5 kg. As a result, the average daily milk yield during this period in ewes with single lambs was 1.33-1.38 kg, while in ewes with twins, it reached 2.18 kg, which was 58.0-63.9% higher.

Using the Ecomilk device, the following indicators of the chemical composition of milk were obtained (Table 2).

Table 2.

Chemical composition of milk of ewes of the Dnieper meat breed, %

Indicators	Ewes with singles	Ewes with twins
Dry matter	17.12 ± 0.43	16.94 ± 0.51
Fat	5.56 ± 0.24	5.42 ± 0.18
Protein	5.84 ± 0.19	5.82 ± 0.23
Lactose	4.78 ± 0.21	4.77 ± 0.20
Non-fat milk solids (NFMS)	11.56 ± 0.37	11.52 ± 0.45
Ash	0.94 ± 0.26	0.93 ± 0.31
Calorie content of 1 kg, kcal	952.5	938.4

The study of the main indicators of the chemical composition of milk revealed the following. The protein content in the milk of ewes from both studied groups corresponded to the baseline value and amounted to 5.84-5.82%. Lactose in milk is the most stable component, with its content at the level of 4.77-4.78%. This is a very important factor, as milk sugar plays a significant role in maintaining constant pressure in the blood-milk system.

In the milk of ewes with single lambs, the fat content was 5.56%, which was slightly higher compared to ewes with twins by 0.14 absolute percent. It should be emphasized that a sufficiently low amount of milk fat at the beginning of lactation is quite a regular phenomenon, which is also indicated by the results obtained by other researchers (Stapay et al., 2016; Fotina, T. & Zazharska, N., 2016).

The content of dry matter in milk is related to its chemical composition, and in our case, its amount turned out to be somewhat higher in ewes with single lambs – 17.12%, whereas in ewes with twins – 16.94%. A similar ratio was observed for the solid non-fat residue of milk (NFMS). As a result, the milk of ewes with single lambs had a higher caloric value – 952.5 kcal, compared to 938.4 kcal in ewes with twin lambs.

The identified differences in milk yield and chemical composition of milk in the studied ewes, in our opinion, are associated with stress-related functional load during the lactation period on the animal's body, which is caused precisely by the larger number of lambs in the litter and the non-differentiated approach in feeding.

As is well known, blood plays an extremely important role in the animal's body. Blood enables the most vital property of living tissue – metabolism. Hormonal and enzymatic regulation is carried out through the blood, as well as the protective functions of the body.

Blood largely reflects not only the general structure of the organism and its constitutional features, but also its physiological state and the associated functioning of

vital processes. For the purpose of monitoring health status and tracking metabolic processes in ewes at the early stage of lactation, key morphological blood parameters were determined. The state of erythropoiesis in sheep was assessed based on the results of erythrocyte counts, hemoglobin content determination, and hematocrit values, on the basis of which red blood cell indices (Color Index – CI and Mean Corpuscular Hemoglobin – MCH) and the Mean Corpuscular Volume (MCV) were calculated.

Differences found in the morphological composition of blood among the experimental ewes indicate the presence of physiological changes or specific adaptive features of certain groups of animals to housing conditions, feeding, or the influence of experimental factors (Table 3).

Table 3.

Hematological indicators of ewes' blood, (M±m)

No. in order	Indicators	Ewes with singles	Ewes with twins
1	Hemoglobin, g/l.	119.1 ± 2.17	1 21.9 ± 1.97
2	Hematocrit, %	34.7± 0.91	36.3 ± 0.72
3	Erythrocytes, T/l.	8.7± 0.17	9.1 ± 0.27
4	Mean corpuscular volume (MCV), fl.	39.6 ± 0.68	39.9 ± 0.53
5	Mean corpuscular hemoglobin (MCH), pg	13.6 ± 0.24	13.1 ± 0.19
6	CI (color indicator), units	0.93± 0.07	0.89 ± 0.08
7	ESR (erythrocyte sedimentation rate), mm/hr	1.0 ± 0.0	1.0 ± 0.0
8	Platelets, G/l	373.5 ± 10.13	278.0 ± 9.92*
9	Leukocytes, G/l	13.1± 0.29	10.6 ± 0.23*
Leukocyte formula			
1 0	Basophils, %	0.0 ± 0.0	0.0 ± 0.0
11	Eosinophils, %	1.0 ± 0.3	0.5 ± 0.5
1 1	Rod-nucleated, %	0.0 ± 0.0	0.0 ± 0.0
1 2	Segmented nuclear, %	57.0 ± 4.5	52.5 ± 6.3
1 3	Lymphocytes, %	41.5 ± 3.8	45.0 ± 4.7
1 4	Monocytes, %	0.5 ± 0.5	2.0 ± 1.0

*Note: * – P<0.05 in compare to the group of ewes with singles.*

More significant changes in red blood cell parameters are observed in ewes carrying twins, which have not only a higher number of erythrocytes but also a higher hemoglobin concentration within them. The obtained data indicate that the blood of these ewes contains a greater number of erythrocytes – 9.1±0.27 T/L, with a volume of 39.9±0.53 fL, whereas in ewes with a single lamb, the number of these formed elements is lower – 8.7±0.17 T/L, although their volume is almost the same – 39.6±0.53 fL. No statistically significant difference in the number of erythrocytes between the experimental groups was found.

It is evident that this morphological differentiation of erythrocytes determines the nature of oxygen transportation to tissues and organs, which is reflected in their

hemoglobin content. The hemoglobin level in ewes carrying twins was 2.4% higher, which may indicate better tissue oxygenation.

The MCH (mean corpuscular hemoglobin) indicator in both groups of animals at the beginning of the study was within the reference range and did not differ significantly. In ewes with single lambs, the mean hemoglobin content per erythrocyte was 13.6±0.24 pg, while in ewes with twins, a decrease of this indicator by 3.8% was observed.

In healthy animals, the color index, which indicates the degree of hemoglobin saturation in erythrocytes, equals one or is close to it. The color index values in the blood of sheep from both experimental groups were within the minimum norm (0.9) and did not differ significantly. Despite certain differences in the red blood cell indices of the examined ewes, the erythrocyte sedimentation rate remained at the same level and was at 1 mm/h.

Leukocytes play an important role in the body, primarily performing a protective function in ensuring cellular immunity, as well as participating in the production of protective antibodies.

The number of leukocytes in the blood of sheep from both groups was within the reference range. However, laboratory test results showed that the blood of ewes with twin lambs had a significantly lower leukocyte count compared to ewes with single lambs – by 23.5%. This difference may indicate a lower immunological reactivity of the ewes, which could be associated with greater stress load on the bodies of animals with twin lambs.

The analysis of the leukocyte formula in the blood of ewes indicates that segmented neutrophils constituted the predominant proportion among leukocytes. In both groups of animals, their content exceeded the physiological norm. Specifically, in ewes that gave birth to a single lamb, the proportion of segmented neutrophils was 57.0%, while in ewes with twins, it was 52.5%.

Lymphocytes form the basis of the immune system, and their level in both groups of ewes was at the lower threshold, ranging from 41.5% to 45.0%, indicating a weakening of adaptive immunity.

It should be noted that in terms of percentage ratio, fluctuations in white blood cells in all examined animals did not go beyond the physiological norm, and no consistent differences were observed.

Discussion. At present, under challenging economic conditions, domestic animal husbandry is one of the priority sectors, with its objectives including the development of breeding improvement programs, especially for newly created breeds, through the rational use of their genetic resources (Iovenko, V. M., 2017; Zharuk, L. V., Koval, T. S., Krayeva, O. Ye., 2020).

One of the key factors in the effective management of sheep breeding, particularly meat production, is the improvement of sheep reproductive abilities by increasing fertility levels, as well as ensuring the survival and intensive growth of lambs from birth to weaning. This rearing period is primarily determined by the amount of milk that the ewe is capable of producing, i.e., her milk yield (Lesyk O. B., Pokhyvka M. V., Makoviichuk S. D., 2021; Nel C. et al., 2023).

The productive capabilities of ewes during the suckling period are determined not only by genotype but also by compliance with technological standards regarding the necessary welfare parameters and proper feeding.

The milk production of ewes is influenced by many factors, the most important of which are the number of lambs born, feeding in accordance with the needs for the required amount of nutrients and biologically active substances, as well as ensuring proper housing conditions (Dwyer, C.M., 2007; Yakovchuk V. S., Zhulinska O. S., Ivanyna O. P., 2021). Crossbreeding can also have a significant impact on the milk productivity of sheep (Černá et al., 2023).

Australian researchers have established that the survival of newborn lambs depends on the ease of lambing, which is influenced by live weight and the duration of the embryonic period (Everett-Hincks et al., 2014; Kleemann et al., 2023). With equal litter size and a similar birth-to-mature body weight ratio, more prolific genotypes exhibit better lamb viability and have a lower optimal birth weight (Gama, L. T. et al., 1991).

The genetic parameters of lamb birth weight influence the genetic evaluation of the ewes' ability to further raise lambs (Everett-Hincks et al., Kim et al., 2017).

According to the results of conducted studies, it was found that single-born lambs had significantly higher live weight and more intensive growth compared to twins—by 34.5% for rams and 27.1% for ewe lambs, with a statistically significant difference. Rams do not always grow faster than ewe lambs during the first month of the suckling period. Twin lambs usually lag in development due to competition for milk.

Similar results were obtained in studies conducted by Pomitun et al. (2016) during the investigation of the growth intensity of Precoce lambs during the first 20 days of the neonatal period. The authors established that the highest growth intensity was observed in single-born ewe lambs, whose average daily gains were 11.4% higher compared to single-born ram lambs and significantly higher by 30.6% and 37.8% than their twin-born peers.

The composition of milk in small ruminants depends on genotype, reproduction technology, balanced feeding, agro-climatic and socio-economic conditions, as well as farm management practices (Dettori M. L. et al., 2017; Skrepets K. V. et al., 2021; Li et al., 2022).

The results of the conducted research showed that there were no significant differences in the chemical composition of milk among ewes with different numbers of newborn lambs. In the studied groups, the content of fat, protein, and lactose in the milk did not differ significantly. The average fat-to-protein ratio in the milk of ewes with single-born lambs was 1:0.95, while in ewes with twin-born lambs it was 1:0.93. At the same time, it is worth noting that, according to most scientific sources, the typical fat-to-protein ratio in milk usually ranges from 1.3 to 1.4 (Moatsou, G., & Sakkas, L., 2019). This pattern is confirmed by the research of Pokhyl V. I. and Mykolaychuk L. P. (2020) on the qualitative characteristics of milk in Romanov sheep, where the fat and protein content ranges from 6.45–6.60% and 4.78–5.20%, respectively.

Sheep milk typically has high levels of milk fat, the amount of which is primarily determined by genotype. However, as numerous studies have shown, several paratypical factors significantly influence its content, and these are not limited solely to the level of complete feeding.

Fotina T. and Zazharska N. (2016) compared the quality and safety indicators of sheep and goat milk depending on the altitude of grazing in the valleys of Zakarpattia. According to their research, the highest fat content in sheep milk – 7.69% and in goat milk – 5.61% was observed at an altitude of 341 meters above sea level ($p<0.01$). At the same time, the protein content and milk density of these animals were the lowest. It was

found that at the highest grazing point (750 meters above sea level), the fat content in their milk decreased – in sheep to 3.27%, and in goats to 2.6%, while the indicators of solid non-fat residue and protein in goat milk were higher.

Blood is an important interior indicator of an animal that characterizes its internal environment, connects biochemical processes in different parts of the body into a single system, and thereby ensures the coordination of all organs and tissues. There is a close relationship between the biochemical parameters of milk and blood and the metabolic status of lactating animals. Andjelić, B. et al. (2022), studying changes in metabolite concentrations in blood and milk during lactation and the correlations between milk and blood, emphasize that milk has great potential for predicting blood metabolites and the metabolic status not only in cows but also in other animal species.

The study of hematological blood parameters allows for the analysis of the health status of animals, the intensity of metabolic processes, and the activity of the body's defense systems. Therefore, determining hematological indicators and their role as an integral marker of redox reactions in the bodies of sheep of newly developed breeds is a pressing need (Zharuk P. G., Astanovskaya-Maslyuk O. Y., Maslyuk A. M., 2020).

The research results revealed a trend toward increased red blood parameters in ewes with twin lambs, which may indicate a higher level of oxidative processes. This is because the greater the number of erythrocytes and the higher their hemoglobin concentration, the more intense the oxidative processes in the body. The regularity of this process is also supported by the findings of Korkh I.V., Boyko N.V. (2016), who studied the morphological composition and natural resistance status of the blood in rams of different genotypes.

In healthy animals, the color index, which reflects the degree of erythrocyte saturation with hemoglobin, is equal to or close to one. In hypochromic anemia, it is significantly lower, and in hyperchromic anemia, it is higher than one. In the blood of sheep from both groups, the color index remained within the minimum normal range and amounted to 0.89±0.08 in ewes with single lambs and 0.93±0.07 in those with twins.

The leukocyte composition of the blood is determined by the complex coordination of leukopoiesis and the rate of leukocyte destruction. At the same time, certain quantitative changes in leukocytes depend on their distribution in the body. Thanks to the redistribution mechanism, even minor physiological changes can alter the leukocyte count in the blood. A distinctive feature of such redistributive leukocyte reactions is their short duration and the absence of significant changes in the leukocyte formula.

Ewes with single lambs exhibited higher leukocyte counts. We interpret these findings as evidence of higher immunological reactivity in the body, which creates favorable conditions not only for the rapid growth of the offspring but also for their increased resistance to many infectious and parasitic diseases.

To assess changes in the ratio of erythrocytes to leukocytes, it is necessary to determine the cellular coefficient, which is calculated by dividing the number of erythrocytes by the number of leukocytes in 1 μL of blood. In most healthy animals, this coefficient is approximately 100 conventional units. However, according to research results, in ewes with single lambs, it was 66 and 86, which may indicate a reduced immune status due to the postpartum period and lactation in ewes.

These data may be useful for further analysis of the influence of the number of lambs born on the health and productivity of ewes.

Conclusions.

The obtained results indicate significant differences between the studied groups of ewes in terms of lamb growth intensity and milk yield, which depend on the number and sex of the newborn lambs. These differences are likely due to the level of stress load or metabolic adaptations of the animals' organisms.

Ewes that gave birth to a single lamb demonstrated more stable hematological parameters, while ewes with twins showed noticeable changes in these indicators, which is associated with increased physiological stress.

In summary, it can be stated that lambs of the newly created Dnipro meat breed are characterized by high growth energy during the first 20 days of the suckling period. This creates favorable conditions for implementing effective measures for the intensive rearing of young animals. Particular attention should be paid to ewes that give birth to twins, considering the increased needs of their bodies for recovery and ensuring the viability of their offspring.

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